Does the United States' Strategic Mobility Program Support the Needs of Operational Commanders?

A Monograph
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Does the Department of Defense's strategic mobility program meet the needs of operational commanders? More importantly, what challenges do operational commanders face because of the inability to project certain capabilities? This monograph argues that the Department of Defense's shortfalls in strategic sealift will limit a ground commander's operational reach, tempo, simultaneity, depth, phasing, transitions, and synergy, while increasing risk and the possibility of early culmination. This work goes into depth with regard to the need for the right mix of large and medium sized roll-on roll-off vessels. In addition, this study explains sealift shortcomings in terms that relate to how an operational commander prosecutes his overall fight. In order to achieve this goal the quantitative research associated with this study goes through a qualitative analysis. The research results of this study then undergo an examination using the elements of operational design such as operational reach, tempo, simultaneity, risk, and culmination. These concepts are the method this study uses to compare quantitative and qualitative data. This monograph uses the United States military's deployments to Operation Restore Hope in Somalia, and Operation Unified Response in Haiti as case studies to examine sealift. Additionally, two notional case studies are conducted using African ports in Nigeria and Kenya to illustrate what may occur during future deployments to those areas. The findings of the study are that the Department of Defense does not possess the right mix of large and medium sealift that best supports operational commanders.

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Abstract

DOES THE UNITED STATES' STRATEGIC MOBILITY PROGRAM SUPPORT THE NEEDS OF OPERATIONAL COMMANDERS by Major Erik E. Hilberg, United States Army, 45 pages.

Does the Department of Defense's strategic mobility program meet the needs of operational commanders? More importantly, what challenges do operational commanders face because of the inability to project certain capabilities? This monograph argues that the Department of Defense's shortfalls in strategic sealift will limit a ground commander's operational reach, tempo, simultaneity, depth, phasing, transitions, and synergy, while increasing risk and the possibility of early culmination.

This work goes into depth with regard to the need for the right mix of large and medium sized roll-on roll-off vessels. In addition, this study explains sealift shortcomings in terms that relate to how an operational commander prosecutes his overall fight. In order to achieve this goal the quantitative research associated with this study goes through a qualitative analysis. The research results of this study then undergo an examination using the elements of operational design such as operational reach, tempo, simultaneity, risk, and culmination. These concepts are the method this study uses to compare quantitative and qualitative data.

This monograph uses the United States military's deployments to Operation Restore Hope in Somalia, and Operation Unified Response in Haiti as case studies to examine sealift. Additionally, two notional case studies are conducted using African ports in Nigeria and Kenya to illustrate what may occur during future deployments to those areas. The findings of the study are that the Department of Defense does not possess the right mix of large and medium sealift that best supports operational commanders.

Table of Contents

Does the United States' Strategic Mobility Program Support Operational Commanders?

Imagine a scenario where the United States desires to enter a failed state or a state in need of support during a humanitarian crisis, and the nation is not able to project its forces due to having acquired the wrong mix of force projection platforms. For the world's lone superpower, this is an embarrassing scenario to encounter especially when considering past investments in power projection. Then imagine compounding that with an increase in projection requirements based on the stateside repositioning of forces after the conduct of two Base Realignment and Closure Commissions.[1] The goal of this monograph is to examine how capable the Department of Defense is at meeting these new requirements while illustrating how previous decisions may affect future operational commanders.

Does the Department of Defense's strategic mobility program meet the needs of operational commanders? More importantly, what challenges do operational commanders face because of the inability to project certain capabilities? The hypothesis for this monograph is that the Department of Defense's shortfalls in strategic sealift will limit a ground commander's operational reach, tempo, simultaneity, depth, phasing, transitions, and synergy, while increasing risk and the possibility of early culmination.

The Department of Defense's transportation system underwent numerous innovations upon reviewing the results of the deployment and redeployment from the Gulf War of 1990-1. The most significant of those reviews was the Mobility Requirements Study Bottom-Up Review Update of 1995. The review identified three key elements to generating an effective transportation system. They were the strategic mobility triad consisting of airlift, sealift, and prepositioning.

The Department of Defense quickly went to work on procuring and incorporating the majority of the study's recommendations. The study recommended a fleet of twenty large cargo vessels, thirty-six

[1] George W. Casey and Peter Geren, *2009 Army Posture Statement* (Washington D.C.: Government Printing Office, 2009), 10.

medium cargo vessels, and an airframe to replace the United States Air Force's C-141 fleet. However, one key recommendation regarding sealift only underwent a partial fix.

The Department of Defense's procurement of several existing medium-sized roll on roll off vessels for placement into the Maritime Administration's Ready Reserve Fleet, under a reduced operating status, was only a partial solution. The procurement effort focused on achieving the strategic goal of available square footage requirements. However, the majority of the ships were medium when considering their overall size, yet their maximum drafts are equivalent to much larger vessels. The procurement achieved a strategic goal with regard to square footage, while leaving a potential operational level problem for future commanders.

Recently, much of the United States Army has undergone a transformation into modular type units in conjunction with the re-stationing of numerous forces to the continental United States. The brigade headquarters that has traditionally commanded and controlled Army watercraft transformed into a multifunctional sustainment brigade headquarters in 2006. How this change affects power projection is also worthy of further examination.

The Department of Defense focused their effort on procuring twenty very large cargo vessels, called large medium-speed roll-on roll-offs (LMSR), in order to meet the square footage recommendations from the study. The focus was getting the maximum square footage for money spent.[2] Inherent to the plan of getting the most square-footage for the funds available is the acceptance of the risk that the United States fleet of large cargo vessels may not be able to access many world ports. This scenario or tension is part of a tradeoff that occurs between strategic objectives and operational realities.

At the strategic level, the desire is to possess the quantitative or maximum square footage possible. At the operational level, the desire is qualitative which involves having vessels that can access

[2] United States Government Accounting Office, *Shipbuilding: Navy Plan to Acquire Additional Strategic Sealift* (Washington D.C.: Government Printing Office, 1992), 2. The 1995 MRSBURU study called for 20 large medium-speed roll-on roll-off vessels. However, DoD only procured 19 of these vessels, there was no new construction for the medium sized fleet. This GOA report highlights some of the negotiation between GOA and DoD on potentially reducing the procurement by one or two vessels in order to purchase new vessels that could achieve the 24 knot speed requirement that MRSBURU and DoD called for.

the ports where operational level commanders desire to conduct their reception, staging, onward movement, and integration. The case studies in this monograph depict how simply procuring square footage requirements does not always equate to one's desired results. This is especially the case when vessels are too large to berth at shallow draft terminals. Recent history proves the occurrence of this phenomenon, which is why this monograph examines the capabilities of the large and medium cargo vessel fleets during operations over the past twenty years.

The United States' deployments to Somalia and Haiti were relatively small in scale. Yet, the deployments to both of these locations created force projection challenges. The missions to Haiti and Somalia involved less than 30,000 United States troops.[3] Neither of these deployments involved a major projection of combat power, especially in comparison to the over one-half million troops that deployed to Saudi Arabia in order to liberate Kuwait from their Iraqi captors in 1990. The missions to Haiti and Somalia may provide information on how well the United States' strategic mobility program performed as a system within the infrastructure of those nations. Studying how well that system interacts with the limited infrastructure of those nations may provide valuable insights towards future operations in similar scenarios. The two historical case studies this monograph utilizes involve host nations that possess limited or damaged port infrastructure. The results of the effort may identify potential risks associated with the strategic mobility program.

The intent of the 1995 and subsequent reviews was to examine requirements for America's emerging force posture. The continental United States was becoming the home base for the majority of that force. When Russia was no longer a near peer to the United States, the doctrine of containing communism in Europe was no longer necessary. With the prospect of relative peace in Europe during the early 1990s, the United States decision was to redeploy the bulk of its European forces back to the continental United States. Since that decision, the United States has projected power from home to

[3] United Nations, "United Nations Operation in Somalia II," The United Nations Department of Public Information (2003). http://www.un.org/en/peacekeeping/missions/past/unosom2.htm (accessed June 6, 2010).

support numerous contingencies that include Somalia, Haiti, Bosnia, Kosovo, Afghanistan, Iraq, and most recently a second mission to Haiti.

Today a similar restructuring is in progress with the "Grow the Army Campaign." Despite new growth in end strength, the stationing of those forces occurs stateside. The increase in stateside force posture resulting from the 2005 Defense Base Realignment and Closure Commission and the Grow the Army Campaign creates an even greater dependence on power projection or strategic mobility.[4]

Roll-on roll-off vessels (ROROs) are ships with configurations designed to support rolling stock. The design of these vessels allows for the rapid loading and unloading of vehicles. The vessels typically have high steel sides that contain and safeguard their cargo from the elements. Another key feature of the vessels is their weather deck where containers, boats, and other outsized cargos are often stowed.

The civilian equivalent to the United States Navy's roll-on roll-off fleet is the commercial car carrier vessel. The difference between the two is that the Navy's ships have stronger decks that can hold more weight, higher deck heights that are often adjustable, and the tie-down points on the Navy's vessels are much stronger. The heavy deck loads and tie-down points support the military's heavy vehicles and tanks. Most of the United States Navy's roll-on roll-off ships have self-sustaining capabilities such as cranes. In the commercial world, most ships have designs that perform one specific purpose in order to achieve any economy of scale. Naval cargo vessels require adaptability in order to transport a variety of cargos for an unknown variety of contingencies. A key difference between roll-on roll-off vessels and general cargo or break-bulk vessels is that the entire inner portion of the roll-on roll-off vessel is open or accessible without the removal of hatches, walls, or barriers. The ability to drive a vehicle from one end of the vessel to the other or from one deck to another allows rapid and efficient stowage.

The large medium-speed roll-on roll-off vessel is an imposing power projection capability. The potential usable square footage of the vessel is 380,000 square feet of cargo or eight football fields of

[4] United States Army, "Army Announces Stationing Decisions," United States Army (December 2007), http://www.army.mil/-newsreleases/2007/12/19/6676-army-announces-stationing-decisions/ (accessed on August 8, 2010).

space. The amount of square footage on the vessel equates to just under a heavy brigade combat team's worth of supplies and equipment.[5] An Army Stryker Brigade Combat Team represents over 210,000 square feet of cargo with over 1,400 vehicles.[6] All of the brigade's equipment easily fits into the large medium-speed roll-on roll-off vessel. The vessel imposes many challenges on the ports where it lands. The maximum draft of the large medium-speed roll-on roll-off vessel is just under thirty-seven feet of water.[7] Therefore, the port and harbor must be capable of servicing vessels of such depth. Since the large medium-speed roll-on roll-off vessel stores over 380,000 square feet of cargo, its ports of call require at least four to five times that amount of square feet of open storage for efficient marshalling of the cargo loaded inside the large medium-speed roll-on roll-off vessel. Another key concern is whether the harbor and its approach can support the depth, length, width, and turning radius of such a large vessel. Lastly, the berthing space at the port must be able to physically fit and tie-down a vessel that is over 950 feet in length.

Typically, a vessel sails with close to sixty-five percent of its square footage capacity fulfilled. The thirty-five percent of open space consists of space between the front, back, and sides of vehicles plus the space between the cargo and the walls of the vessel. The needs of the operational commander may require a rapid discharge of certain capabilities at the port. This can reduce the percentage of potential stowage while increasing the effectiveness of the operational force. The stowage factor of a vessel often represents a tension between the strategic and operational levels.

The intent of this study is to examine how well the United States' fleet of large cargo vessels supports operational commanders in achieving their campaign objectives. The study examines the elements of operational design during past and potential conflicts to achieve this intent. A critical item to examine is how many of the world's ports can accept a large medium-speed roll-on roll-off vessel. The

[5] United States Navy, "Large, Medium-speed, Roll-on/Roll-off Ships T-AKR," United States Navy (August 31, 2009), http://www.navy.mil/navydata/fact_display.asp?cid=4600&tid=500&ct=4 (accessed on May 16, 2010).

[6] Surface Deployment Distribution Command, *SDDC Spring Almanc 2009* (Washington D.C.: Government Printing Office, 2009), 47.

[7] Transportation Engineering Agency, Surface Deployment and Distribution Command, *SDDC Pamphalet 700-4, Vessel Charateristics for Shiploading* (Scott Air Force Base, IL: Government Printing Office, 2007), 136.

Department of Defense's alternative when a vessel cannot be loaded pier-side in order to support military operations is a process known as joint logistics over-the-shore. Joint logistics over-the-shore involves building an elevated causeway, a floating causeway, or the improved navy lighterage system (INLS) that connects into a vessels existing ramp system to allow the discharge of cargo while out at sea in deep water.[8] Joint logistics over-the-shore is another imposing power projection capability that few nations can imagine affording or conducting.

The conduct of a joint logistics over-the-shore requires extensive logistics support and preparations by all of the parties involved. At a minimum, those parties include command and control personnel, lighterage vessels, tugboats, harbormasters, barge derrick cranes, beach preparation crews, cargo handlers, and cargo documenters.[9] The point being that the operation is complex and time consuming. The resources to conduct the mission involve slow moving boats with slow transit times and a significant assembly period that spans 7-14 days.[10]

Many works have studied the feasibility of the large medium-speed roll-on roll-off vessel, the C-17, and prepositioned afloat cargo. Examples of such works are the Mobility Requirements Study Bottom-Up Review of 1995, the Quadrennial Defense Reviews of 2001 and 2006, and the Army Materiel Command's review of the Operation Iraqi Freedom deployment.[11]

There are also several studies highlighting the shortcomings of the large medium-speed roll-on roll-off fleet. Many of the studies identify the need for some type of vessel that can bridge the gap between them and the limitations of shallow draft ports. Kenneth Hickins' study titled, "The United States Military's Weakest Link," identifies the overall shortcomings and successes of the strategic mobility

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[8] United States Transportation Command, *Joint Logistics Over-the-Shore Planners Handbook* (Scott Air Force Base, IL: Government Printing Office, 2002), 25.

[9] Ibid, 2-7.

[10] Ibid., 43.

[11] United States Army Materiel Command, *Operation Iraqi Freedom - "It Was a Prepostioned War"* (Washington D.C.: Government Printing Office, 2004). The Army Materiel Command's article reviews the effectiveness of the large meduim speed roll-on roll-off vessel and the Army's preposioned afloat program during Operation Iraqi Freedom. The force projection challenges of Operation Iraqi Freedom were cumbersome despite numerous years of planning, the use of prepostioned afloat vessels and the large medium speed roll-on roll-off fleet.

program in a very articulate and detailed manner.[12] However, the focus of that work was the entire spectrum of the system; whereas this study focuses specifically on sealift in terms related to operational art and design.

Another excellent work studies the capabilities of the Theater Support Vessel. The focus of the study is how the Theater Support Vessel can augment the execution of joint logistics over-the-shore. However, the intent of the work was to examine the exact number of Theater Support Vessels the Department of Defense should procure.[13] The study examined the Theater Support Vessel as a potential fix for the Department of Defense's medium sized roll-on roll-off fleet and concluded that the Theater Support Vessel best works to provide intra-theater lift in a rapid manner. Due to its limited carrying capacity, the vessel best serves commanders once in a theater of operations. The Theater Support Vessels currently serving in Kuwait and the Persian Gulf perform missions of this nature. These vessels deliver or lighter cargos to ports in the Persian Gulf region.[14] Lightering refers to the process of taking goods or cargos from a larger ship to a smaller ship that can access shallow waters or a bare beach.

The Department of Defense's Mobility Requirements Study for 2005 and the Congressional Research Service's analysis of that study are two other works that analyzed the shortcomings of the medium sized vessel fleet.[15] Both studies identify the faults of the cargo vessel fleet while examining potential replacements that the Department of Defense may procure to eliminate deficiencies. However, neither study articulates the current problem in terms that show the shortcomings operational commander's face because of those challenges. The Congressional Research Service study highlights the

[12] Kenneth E. Hickins, Strategic Mobility: "The U.S. Military's Weakest Link," *Army Logistician* (November-December, 2002), 34.

[13] Joseph P. Crowley, *DOES THE ARMY NEED THE THEATER SUPPORT VESSEL? IF SO, HOW MANY?* (Carlisle Barracks, PA: The United States Army War College, 2004).

[14] Steven R. Trauth, "Army Transformation at Sea: The New Theater Support Vessel," *Military Review* (November-December, 2005), 51.

[15] Jon D. Klaus, *Strategic Mobility Innovation: Options and Oversight Issues* (Washington D.C.: Congressional Research Service, 2005), 11.

failure to procure a shallow draft medium sized high speed roll-on roll-off platform as an "issue of regret" representing a significant lost opportunity.[16]

One trend amongst strategic mobility studies is that authors typically identify the main issue of overall size and draft among the fleet. However, none of the studies to date articulates the issue in a manner that analyzes the problem at the operational level using the elements of operational art and design. The lack of analysis at the operational level may be why the issue has not generated much interest. Until an analysis displays the problem in those terms, it may not garner the support or attention it truly deserves.

The intent of this work is to go into depth with regard to the need for the right mix of large and medium sized roll-on roll-off vessels. In addition, the intent of this study is to tie all of the shortcomings discussed so far in terms that relate to how an operational commander prosecutes his overall fight. In order to achieve this goal the quantitative research associated with this study goes through a qualitative analysis. The research results of this study then undergo an examination using the elements of operational design such as operational reach, tempo, simultaneity, risk, and culmination.[17] These concepts are the method this study uses to compare quantitative and qualitative data.

The aim of this study is to identify those effects historically using the most recent mission to Haiti, Operation Unified Response, and the mission to Somalia from 1992 to 1994, Operation Restore

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[16] Amy Butler, "Pentagon Transformation Analysis Outlines Military Capability Gaps," *Defense Daily* (November 19, 2004), 1.

[17] United States Army, *Field Manual 3-0, Operations* (Washington D.C.: Government Printing Office, January, 2008), 6-74-87. United States Army, *Field Manual 3-0, Operations* (Washington D.C.: Government Printing Office, January, 2008), 6-97. FM 3-0 defines operational reach as a tether, a function of protection, sustainment, endurance, and relative combat power. A unit reaches its culminating point once exhausting their operational reach. Throughout this monograph, an ideal employment of operational reach is one that provides uninterrupted logistics, medical support, and pace of operations. The right mix or flow of cargo and personnel combined with a planned level of tempo aids in stretching the potential culmination point of the force. FM 3-0 defines tempo as the speed and rhythm of military operations throughout time concerning the enemy and his disposition. Tempo allows the friendly force to seize and maintain the initiative. FM 3-0 defines simultaneity and depth as the ability to extend operations in time and space. Sealift best supports tempo, simultaneity, and depth by getting the desired resource or effect to the proper place at the proper time in order to best support the commander. Ideally, the proper mix of medium and large sealift combined with its proper usage allows the commander and planner to utilize tempo, simultaneity, and depth in a manner that creates synergism. This occurs when the synergistic effect is greater than the sum of the parts that deployed via sealift.

Hope, as examples. A comparison of the historical case studies and two notional case studies occurs next, with Nigeria and Kenya as the notional case studies for this monograph. They are potential examples of nations or regions where the United States may face future challenges. The decision to use nations and ports in Africa is due to the current nature of conflict, the potential for relief missions in the region, and the untested capabilities of the United States' newest combatant command, Africa Command (AFRICOM).

Somalia – Sealift during Operation Restore Hope

In December of 1992, the United States made the decision to support United Nations operations in Somalia. Initially the United States' interest was supporting the evacuation of noncombatants and providing humanitarian relief after the fall of the General Siad Barre's government in 1991. Shortly after the fall of the official government in Somalia, clan warfare became the norm. Fourteen clans were competing for vital resources that left innocent everyday Somalis as the victims. The nation was suffering from horrific droughts and a "famine of Biblical proportions." [18] In late 1992, over one-half million Somalis met their death as victims of the famine. Over one million Somalis had the potential to meet the same fate if the international community did not see fit to intervene.[19] In light of the horrific conditions, President George H.W. Bush made the decision to intervene in November 1992, just two months prior to leaving office.

The United States response in Somalia went through three evolutions. The first was Operation Provide Relief, which took place between August 15, 1992 and December 8, 1992. The focus of this mission was proving humanitarian relief. The second was Operation Restore Hope, which took place between December 9, 1992 and May 4, 1993.[20] Operation Restore Hope was the first phase with the deployment of a significant amount of United States Army troops. Initially, the United States authorized 30,000 troops for the deployment.[21] However, due to the security situation and other realities on the ground the United States deployment of troops was closer to 10,000 personnel. Eventually, the United Nations coalition was over 38,000 troops strong, representing twenty-three nations.[22] In November 1993, an additional 17,000 United States troops deployed to from the United States led joint task force

[18] Kenneth Allard, *Somalia Operations: Lessons Learned* (Washington D.C.: National Defense University, 1995), 13.

[19] Ibid., 13.

[20] Ibid., 14.

[21] David Kassing, *Transporting the Army for Operation Restore Hope* (Santa Monica, CA: Rand Corporation, 1994), 8.

[22] Richard W. Stewart, *The United States Army in Somalia 1992-1994* (Washington D.C.: Government Printing Office, 2006), 10.

commanded by Major General Thomas M. Montgomery.[23] The final phase of the mission was Operation Continue Hope, which is synonymous with the United Nations Mission Somalia II (UNISOM II). The United Nations and others often call the first two phases of the United States' involvement in Somalia as United Nations Mission Somalia I (UNISOM I). The United States withdrew from Somalia in March of 1994 completing Operation Continue Hope. One year later the United Nations withdrew from Somalia in March 1995.

The objective of the Joint Task Force that deployed to Somalia was to provide aid to humanitarian relief organizations. The objective was open-ended with no real means of measuring performance or effectiveness. The challenge with this objective was determining what the true termination criterion was in Somalia. The mission was unique and therefore military planners were not likely to receive very clear termination criteria. Termination criteria are a design concept that allows planners to determine the set of conditions that must occur prior to ending operations.[24]

The phasing and transitioning of the operation involved landing the 1st Marine Expeditionary Force (MEF) as the joint task force headquarters with a Special Purpose Marine Air-Ground Task Force and the Army's 10th Mountain Division as the main maneuver forces. The operation's first phase involved securing the port of Mogadishu and key lines of communication through Marine and Navy Seal amphibious landings. The goal of the first phase was securing bases of operations and critical logistics hubs.[25] After securing the port, the next phase of the operation and the first transition occurred as the main body of maneuver forces started to deploy inland to provide aid at key relief sites.[26]

The 7th Transportation Group was to relieve the Marines of the port operator mission a few weeks into the mission, freeing them up for other operations. The expanded capability provided by this unit was

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[23] Stewart,15.

[24] United States Joint Forces Command, *Joint Publication 3-0, Joint Operations* (Washington, D.C.: Government Printing Office, 2006), IV-5 & 8.

[25] Katherine A. W. McGrady and David J. Zvijac, *Operation Restore Hope: Summary Report* (Alexandria, VA: Center for Naval Analyses , 1994), 40.

[26] Ibid., 45.

critical in the planning of how to receive, stage, onward move, and integrate forces. The capability of the port operator, the 7th Transportation Group, was to facilitate the sequencing or phasing of the right forces through the port with their subsequent movement into the right maneuver space while on the appropriate timeline. Time phased force deployment data (TPFDD) represents the senior or combatant commanders desired flow of forces. It is imperative that operators and planners adhere to the sequencing of time phased force deployment data since this is the document the joint force utilizes when planning. In addition, the time phased force deployment data represents the sequencing of movements from the strategic base to the operational theater. The document is also a representation of the commander's priorities for reception, staging, onward movement, and integration.

The first phase of the operation put a premium on security and throughput. Without either of these components, the force could reach their culmination point due to a lack of operational reach or combat power. During a stability operation the ability to stay ahead of the security situation while providing necessary aid is directly tied to operational reach and culmination.[27]

Achieving simultaneity, depth, and tempo was imperative to a successful penetration into Somalia. Achieving these concepts would have a synergistic effect that would allow the joint force to stay ahead of potential adversaries and the humanitarian crisis. Upon arriving into Somalia and integrating with their equipment, units were to deploy into their designated security zones. The sequencing of this part of the operation relied on the careful penetration of units into Somalia with adequate security and humanitarian aid capabilities. The plan relied on sealift and port operations adhering to schedule.[28] Somalia represents a great example of the potential risk involved when strategic level plans utilize optimal deployment or projection models. A plan that fails to afford leeway for errors or delays may suffer from second and third order effects that may affect the operational commander's desired simultaneity, depth, and tempo. Furthermore, the operational commander may find himself in a position where his new burden of risk is more than previously acceptable.

[27] Field Manual 3-0, 6-97.

[28] McGrady and Zvijac, 40-44.

On December 9, 1992, the United States Marines Corps and Navy Seals arrived at the port in Mogadishu. Their initial assessment of the port was that the entire facility was in an ill state of repair and use.[29] The measurements of the draft or depth of the harbor and piers at high tide was in the range of thirty-five to thirty-seven feet.[30] The largest cargo ship in the United States cargo fleet was the fast sealift ship. The maximum draft of those ships, with a maximum weight load, was just under thirty-seven feet of water. The fast sealift ship is the predecessor to the large-medium-speed roll-on roll-off vessel. The maximum available square footage of the fast sealift ship is 150,000 square feet of cargo, which is less than half of the large medium-speed roll-on roll-off ship's tremendous capacity. It is important to remember that a normal load occupies approximately sixty-five percent of the vessel's cubic capacity. Most vessels reach their spatial or cubic storage limits before the reach their maximum weight limits.

Much of the Marine Corps prepositioned afloat equipment was on vessels with maximums drafts between twenty-nine to thirty-five feet of water. The method of sustaining and opening the port in Mogadishu was contingent on the arrival of several prepositioned vessels that drew thirty-five feet of water. No one on the ground was comfortable with trying to make a voyage into the harbor with a margin of error ranging from zero to two feet. It quickly became clear that the opportunity to call on and exit the port could only occur at high tide when the depth was thirty-five feet to thirty-seven feet deep.[31] Several weeks' earlier military planners made the decision to deploy the United States Marines to occupy the port with subsequent relief from those duties by the Army's 7th Transportation Group.

The 7th Transportation Group was often called the United States Army's Navy, since it possessed nearly all of the active Army's watercraft. The vessel containing prepositioned equipment for the port opening and initial sustainment of forces was undergoing routine maintenance in Germany during the

[29] McGrady and Zvijac, 39.

[30] Ibid., 40.

[31] Ibid., 40.

initial planning. The vessel's cargo was in storage in the United Kingdom.[32] The vessel, the Motor Vessel American Cormorant is a semi-submersible ship that can unload in-stream.

The Motor Vessel American Cormorant was an obvious choice for the prepositioning of Army watercraft that includes tug-boats, floating cranes, and landing craft. In addition, the vessel was in possession of a barge with two Army Reverse Osmosis Water Purification Units (ROWPUs) that could produce 150,000 gallons of water daily.[33] The Reverse Osmosis Water Purification Units could provide three times the capability of the Marine Corps Amphibious Assault Buoyant Water System (AABFS) that were onshore at the Port of Mogadishu. The military's plan for port opening normally calls for the equipment from the Marine Corps and the Army to arrive simultaneously. Because of this, their prepositioned equipment stays afloat in the same location unless undergoing maintenance as was the case during this operation. The result was a great deal of stress on the Marines at the port since they were yet to receive their full complement of equipment. The water supply situation was desperate throughout the month of December. The situation was so dire that many of the vessels that were already unloaded had to stay in port to supply units with their stores of clean water. Normally those vessels needed to return home to sustain throughput to the theater.[34] If they were under contract, the demurrage charges for exceeding the lease for such vessels far exceeds the cost of the water provided. However, as the water supply onshore diminished its value was becoming priceless to the Marines on shore in Mogadishu.

On December 31, the Motor Vessel American Cormorant was at the port of Mogadishu. However, it ran into the same fate as many of the Marine Corps Maritime Prepositioning Force (MPF) vessels. After rushing from Europe and loading in a rapid manner, the vessel took part in one folly after another. Three of the Army's prepositioning ships were unable to access or unload in Mogadishu during

[32] Kassing, 31-2.

[33] John. J McGrath, *A History of Sealift and Force Sustainmnet Operations During the Somalia Intervention (1992-1994)* (Monterrey, CA: Naval Postgraduate School, 1996), 24.

[34] McGrady and Zvijac, 44.

the month of December.[35] Those vessels were the Motor Vessel American Cormorant, Motor Vessel Green Harbor, and the Motor Vessel Green Valley. First, the maximum drafts of the vessels were too deep for them to enter the port. The second issue preventing their discharge was that in order to unload in-stream (logistics over-the-shore) the equipment from the Motor Vessel American Cormorant was necessary. The weather and high sea-state in Somalia made the in-stream discharge of the Motor Vessel American Cormorant an impossible task. The vessels were lighterage aboard ships (LASH) that carry crucial cargos that aid in initiating port openings and throughput operations. The lighterage aboard ships are designed to unload barges that are then tugged or floated into shallow waters to facilitate joint logistics over-the-shore.[36] The sequencing or phasing and transitions envisioned for the deployment were now in jeopardy. The delays violated the synergistic effect that the proper sequencing of the force flow was to achieve at the operational level.

After realizing the Army's three prepositioning ships could not access Mogadishu, leadership made the decision to move these vessels to Mombasa, Kenya for discharge. Upon arrival in Kenya, local authorities denied the vessels access to their ports due to the nature of some of the cargo. One of the prepositioned ships was in possession of the initial munitions resupply. As well, the field hospital, tents, generators, additional water purification units, and material handling equipment for the port were on those vessels.[37] Military planners, and most importantly, the troops on the ground were relying on those cargos.

Ultimately, the decision was to send the three prepositioning ships back to Diego Garcia, where they normally set afloat in the prepositioned fleet, in order to transfer the loads from large to smaller ships.[38] The vessels arrived at Diego Garcia on January 11-12, and returned to Mogadishu between January 24 and February 2. The arrival was four to nine weeks later than the intent of the initial plan. During this period, the time phased force deployment data underwent numerous alterations. Initial plans

[35] Kassing, 31-2.

[36] United States Transportation Command, *Joint Logistics Over-the-Shore Planners Handbook*, 2.

[37] Kassing, 32.

[38] Ibid., 32.

anticipated a force of 30,000 troops deploying at the start of Operation Restore Hope.[39] The target then moved to 20,000 troops.[40] In the end, Task Force 10th Mountain took on the mission with approximately 10,000 troops.[41] The task force was up and running in late December. As mentioned earlier, nearly a year later the task force swelled with the addition of over 17,000 troops.

In early December, the United States fleet of fast sealift ships were stateside loading unit equipment for missions in Somalia. Due to the constraints at the port, restrictions were set on the weight of those vessels in order to accommodate draft restrictions at the port. The vessels are 946 feet long, over one-hundred feet wide, and their maximum draft is just under thirty-seven feet of water.[42]

Many of the fast sealift ships left United States ports with low levels of utilization. The changes to the force structure, or the time phased force deployment data, were a cause for further problems. It took sixty-four days to project 1.2 million square feet of cargo to Somalia. As mentioned, most of the vessels carrying cargo to Somalia were underutilized. If all the vessels bound for Somalia left the United States with full loads, the same square footage would arrive on the thirty-fourth day of operations, which is nearly twice as fast as how the plan actually evolved.[43] However, one must also understand that no force projection mission is likely to proceed perfectly. There is entirely too much complexity within the system for this to happen. However, leaving the port of embarkation half-full is never a good scenario. Such a scenario is evidence of having the wrong mix of roll-on roll-off ships to accomplish the mission efficiently and effectively.

The situation at the port and the inability to project combat power clearly had an adverse effect on the planning for the force-flow. The force structure proposals for the mission constantly changed throughout December of 1992. Those changes were often occurring at the last minute, which is a rare

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[39] Kassing, 6.

[40] Ibid., 8.

[41] United States Army Center for Military History, *The United States Army in Somalia 1992-1994,* 10.

[42] Military Sealift Command, Fast Sealift Ship Factsheet.

[43] Kassing, 37.

scenario for a mission of this type. [44] Fortunately, none of the force or the port was under a significant threat during the early portion of the mission. The story of the force projection and early sustainment missions may have a different historical theme if a significant attack took place in conjunction with the low stocks of water, ammunition, fuel, and life support.

A RAND report studying the effort in Somalia highlights how much of the distribution or supply chain never underwent significant stress due to the lack of significant conflict on the ground.[45] Even then, the water situation alone was close to becoming a catastrophe. In the end, the hard work and innovation of the Marines, Sailors, and Soldiers on the ground made the mission a success. Their effort at the port was beyond commendable. However, a nation as wealthy and resource rich as the United States can certainly mitigate many of the strategic mobility risks that were discovered during operations in Somalia. In terms of operational design, the inability to operate jointly at the port or the inability of the Army to arrive and operate the port led to numerous issues in achieving simultaneity. Army doctrine states that simultaneity "requires the ability to conduct operations in depth and to orchestrate them so that their timing multiplies their effectiveness."[46] The water, ammunition, fuel, and life support issues at the port demonstrate a lack of simultaneity. They also demonstrate the potential catastrophe that may occur when a commander never has the opportunity to achieve his desired level of simultaneity.

The flow of forces equating to the ground commander's desired tempo or phasing was beyond difficult to achieve. Power projection, or the reception, staging and onward movement of cargo had intrinsic ties to the operational commander's desired tempo. The difficulty of operating within Somalia's limited infrastructure and its incompatibility with large United States vessels was the source of numerous disruptions in tempo. Joint doctrine explains the benefits of tempo in that, "By acting faster than the situation deteriorates, commanders can change the dynamics of a crisis and restore stability. The

[44] Kassing, 16.

[45] McGrady and Zvijac, 9.

[46] Field Manual 3-0, 3-16.

capability to act quickly enhances flexibility and adaptability across the spectrum of conflict."[47] Clearly, tempo was a requirement for success in Somalia. The inability to obtain a desirable tempo combined with not getting the right forces at the right time through the port limited the ability to use phasing and transitions. Effective use of this design concept can extend the ground commander's potential culmination point. The right use of tempo, phasing, and transitions can achieve a synergistic effect where a small number of resources achieve results greater than the sum of their parts.[48] Synergy is what the utilization of operational design strives to achieve. However, when the projection component of the deployment system fails to operate effectively, synergy is impossible to achieve.

The inability to bring in the surge and prepositioned fleet of ships effectively brought too much risk and early culmination for the original troop plan. United States Army doctrine defines three conditions during stability support operations that define culmination. They are, "being too dispersed to adequately control the situation, being unable to provide the necessary security, and lacking required resources."[49] The situation at the port had ties to all of these situations occurring during Operation Restore Hope.

The inability to project power had ties to a force structure consisting of light forces and almost no armor or mechanized forces. The result was a disruption in the commander's and planner's anticipations for simultaneity and depth. The inability to penetrate significant combat power beyond Mogadishu's port early on changed the focus from establishing a significant security presence to distributing aid. Fortunately, very little fighting took place early on in Somalia. The lack of fighting may have ties to the size and type of force that penetrated outside of the airport and seaport. The lack of operational reach in Somalia's early stages had significant effects on future operations and overall expectations of the mission**.** Furthermore, this lack of operational reach led to less distribution of aid to the Somalis.

[47] Field Manual 3-0, 6-80.

[48] Ibid., 6-88-91.

[49] Ibid., 6-94.

Joint Publication 3-0 is the United States military's joint forces doctrine for operations, it defines operational reach as "the distance and duration across which a unit can successfully employ military capabilities."[50] The Army defines it as, "a tether or a function of projection, sustainment, endurance, and relative combat power."[51] The end of one's operational reach signifies the point at which military operations culminate.

The results of the force projection challenges had little effect on the future of strategic mobility as a whole. The construction of the large medium-speed roll-on roll-off fleet, which was well larger than the fast sealift ship used in Somalia, went as planned. This achieved the strategic ends in regards to desired square footage. However, this was done while ignoring the qualitative recommendation to procure or develop medium-sized fast sealift with shallow drafts. Substitutions for this fleet were made through use of existing vessels, most of which were retrofitted. The issue with this fleet is its lack of speed and deep depths. Unfortunately, the inability to access ports due to maximum draft or depth was an issue during another small-scale deployment.

[50] Joint Publication 3-0, IV-14.

[51] Field Manual 3-0, 6-74.

Haiti – Sealift during Operation Unified Response

On January 12, 2010, a magnitude 7.0 earthquake struck ten miles southwest of Port-au-Prince, Haiti. The earthquake on this date was the most severe that Haiti had ever experienced.[52] The devastation from the earthquake was widely broadcast and there was an immediate outcry for help. The United States has a long history of operations in Haiti and the island of Hispaniola that include relief efforts and government restoration. Haiti is the poorest country in the western hemisphere, which exacerbated the devastation the earthquake caused.[53] The combination of poor infrastructure and extreme devastation from the earthquake limited the ability of Haiti to recover in a rapid manner.

There was little doubt among the American public, political, and military leaders that the United States would need to help Haiti. The United States decision was to deploy the 22nd and 24th Marine Expeditionary Units, the 2nd Brigade Combat Team of the 82nd Airborne Division, the 3rd Expeditionary Sustainment Command, the 7th Sustainment Brigade, a brigade sized medical task force, three amphibious vessels that included 2,000 Marines, and one hospital ship, the USNS Comfort.[54] The deployment portion of Operation Unified Response involved crisis action planning, meaning there was very little advance notice. Scenarios involving rapid deployments were something the United States Army routinely prepared for after the Cold War. However, due to the nature of today's operating environment that includes pre-planned deployments based on the Army's force generation model, units seldom prepare for contingency-based deployments. A critical issue is the fact that combatant commanders publish their desired deployment schedules to Iraq and Afghanistan months even years prior to their execution. This eliminates

[52] Mallory Simon et al., "7.0 Quake Hits Haiti; Serious Loss of Life Expected," CNN (January 13, 2010), http://www.cnn.com/2010/WORLD/americas/01/12/haiti.earthquake/index.html (accessed on May 9, 2010).

[53] The United Nations Childrens Fund, UNICEF urgently appeals for aid for Haiti following devastating earthquake, UNICEF (January 12, 2010), http://www.unicefusa.org/news/releases/unicef-urgently-appeals-for.html (accessed on May 9, 2010).

[54] Richard E. Killblane, "Operation Unified Response, Haiti Trip Report" (Office of the Chief of Transportation, May 3, 2010), 2. Richard Killblane serves as the Command Historian for the United States Army Transportation Center, Fort Eustis. He deployed to Haiti to collect historical information on sustainment operations during Operation Unified Response in Haiti in 2010. Richard Killblane's reports, interviews, and other pertinent documents are stored online in an Army Knowledge Online (AKO) Sustainment Knowledge Network (SKN) Virtual Network Library Suite titled "Haiti Relief Operations". The site is accessible via https://www.us.army.mil/suite/doc/12720672&inline=true.

the desire or need to train for limited notice deployments. Fortunately during Operation Unified Response, there were enough key leaders with the right type of operational experience remaining in many of the deploying units to make things happen in this multinational, joint and expeditionary effort.[55]

One scenario involving the locations of key leaders and units made Haiti's crisi action planning unique. Lieutenant General P.K. (Ken) Keen the deputy commander of the United States Southern Command, the geographical combatant command whose area of operations includes Haiti, happened to be on the island at the time of the earthquake on a scheduled visit.[56] Prior to the earthquake, United Nations Stabilization Mission in Haiti (MINUSTAH) was on the ground operating within the nation. The Brazilian Army was the lead nation for the mission consisting of 6,490 troops and 1,622 police officers.[57] The force commander, Major General Floriano Peixoto, had first met Lieutenant General Keen in 1984 when then-Captain Keen was serving on a paratrooper exchange program for the 325th Airborne Infantry Regiment. In 1987, then-Major Keen attended Brazil's Command and General Staff College. [58] As a result, the two officers kept in touch with one another throughout their careers.

Lieutenant General Keen and Major General Floriano Peixoto's personal rapport and trusting relationship prior to the earthquake allowed for the crisis action planning to occur in an open and collaborative environment.[59] Furthermore, the presence of a combined United States and Brazilian mission that mutually reinforced one-another in Haiti ensured unity of relief efforts. This relationship aided Lieutenant General Keen and the United States Southern Command in synchronizing events early on in the crisis in order to achieve better depth, tempo, and simultaneity to the operation.

The first challenge for this endeavor was identifying what force to deploy and how to get that force into Haiti. The first issue with projecting a force into Haiti was the lack of deep-water ports. A

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[55] Killblane, 7.

[56] Ken Keen et al., "Relationships Mater: Humanitarian Assistance and Disaster Relief in Haiti," *Military Review* (May-June, 2010), 7.

[57] Ibid., 6.

[58] Ibid., 4.

[59] Ibid., 11.

further challenge was the fact the earthquake hit within ten miles of Haiti's best marine terminals located within Port-au-Prince. The majority of the nation's port infrastructure had crumbled into rubble that fell into the harbor, which complicated future relief efforts.[60]

As the force commitments continued to grow, the decision was to deploy the following United States Ships: the Carl Vinson, the Bataan, the Nassau, and the Carter Hall. One of the unique capabilities that these vessels could provide was command and control, to include communications capabilities.[61] Since the ground force entered Haiti with little knowledge of what the conditions were like on the ground, these vessels provided much needed support to the ground troops and the Joint Task Force-Haiti headquarters.

Engineer assessment teams arrived early on to assess the status of the airport and seaport. The team at the airport had the facility reopened and operational within 30 minutes of their arrival. The seaport was going to require much more work. Many vessels, cranes, and piers had fallen into the harbor during the earthquake.[62]

The lead United States Government agency for Operation Unified Response was the United States Agency for International Development (USAID). The geographical combatant command in charge of Department of Defense forces supporting Operation Unified Response was the United States Southern Command. The United States Southern Command created Joint Logistics Command Haiti to focus on opening ports and establishing distribution operations within Haiti. The joint task force and joint logistics command both were to support the United States Agency for International Development in a supporting role.[63]

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[60] Merle D. Kellerhals, Jr., "Port Repairs Begin to Expand Haitian Reflief Operations," America.gov, (January 20, 2010), http://www.america.gov/st/develop-english/2010/January/20100120122556dmslahrellek0.8382227.html (accessed on August 8, 2010).

[61] United States Southern Command, "Narrative History of Operation Unified Response," United States Southern Command (May 26, 2010), http://www.southcom.mil/AppsSC/factFilesLarge.php?id=138 (accessed on August 8, 2010).

[62] Ibid.

[63] Ibid.

United States Southern Command's campaign plan had two key phases. The title for the first phase was Initial Response and the title for the second phase was Relief.[64] With an increase in deployments to Afghanistan and with over 140,000 troops in Iraq options to support Haiti with a large troop presence were limited. Fortunately, the United Nations Stabilization Mission in Haiti (MINUSTAH) could provide an envelope of security for the American forces deploying to work on the ground in Haiti.[65] By combining efforts with the United Nations Stabilization Mission, Joint Task Force-Haiti found an innovative way to extend their operational reach and potential culmination point.

As the planning emerged it was identified that United Nations Stabilization Mission in Haiti (MINUSTAH) would focus on security tasks while the United States mission in Haiti would focus on mitigating human suffering.[66] The first priority of effort for the Initial Response phase was to restore medical capacity. The second priority was to distribute aid in the form of shelter, food, and water. The third priority was to integrate with the United Nations Stabilization Mission in Haiti (MINUSTAH) and nongovernmental organizations (NGOs). The fourth and final priority was to support the Haitians. Two critical tasks identified during this phase were the opening of the airport and seaport so that humanitarian aid could get into the country.[67]

On February 5, 2010, the mission transitioned to the Relief phase of the operation. A critical component of this transition was the ability to conduct deliberate planning, not crisis action planning. The first priority of effort for this phase was providing shelter, establishing settlements and to conduct debris removal. The second priority was to transition Joint Task Force-Haiti's humanitarian relief efforts to a capable partner once they were ready. The third priority was transitioning to a long-term relief mission that would occur on a much smaller scale.[68] The overarching plan was to work through the first two

[64] Keen et al., 9.

[65] Ibid., 8.

[66] Ibid., 9.

[67] Ibid., 9.

[68] Ibid., 9.

phases while continually evaluating, assessing, and improving the distribution of relief within Haiti. Furthermore, the focus was on executing numerous large tasks that were achievable in the short-term while leaving much of the long-term effort to Haiti, the international community, and future New Horizons missions.[69]

During the crisis action planning, the two critical tasks to achieve were opening the airport and seaport of debarkation, both of which were in Port-au-Prince. After opening the ports Joint Task Force-Haiti's next objective was to establish sixteen strategically located distribution sites, and lastly to conduct engineering efforts in preparation for the rainy season.[70] The engineering efforts were improving current camps while establishing camps away from areas prone to flooding. All of these efforts had ties to establishing a desired tempo, simultaneity and depth, and the utilization of phasing and transitions to extend the force's potential culminating point.

Joint Task Force Haiti was operating in an environment full of unknowns while trying to best support the people of Haiti, the United States Agency for International Development, and the United Nations Stabilization Mission in Haiti (MINUSTAH). Teamwork and collaboration within the United States Government was evident early on in the manner by which Department of Defense assets were moving United States Agency for International Development personnel and equipment at the start of the deployment. The biggest challenge for this effort was achieving synchronization and the benefits of a collaborative effort, which is synergy.

Haiti's main ocean terminals are located in Port-au-Prince and Cape Haitien. Prior to the earthquake, none of the Haitian ports was capable of berthing the large medium-speed roll-on roll-off vessel. The three main vessel berths in Port-au-Prince had depths that ranged from thirty to thirty-two feet deep. The berths are long enough to accommodate the 950-foot long large medium-speed roll-on roll-off

[69] Keen et al., 9. New Horizons missions involve engineering and humanitarian relief missions conducted by USSOUTHCOM in Cnetral American and the Carribean.

[70] Ibid.

vessels with two berths of lengths of over 1200 feet.[71] However, those berths are not deep enough for the vessel to access. Typically the ability to extend the vessels ramps onto the pier are a planning concern, however most of the facilities and equipment that were once pier side had crumbled into the harbor.

The port facilities at Cape Haitien provide better reach into Haiti's hinterland since they are away from the congestion of Port-au-Prince. However, the facility's infrastructure does not compare to Port-au-Prince. The facility has four berths with depths ranging from eight to twenty-nine feet deep. The one berth that is above twenty-nine feet deep is also over 800 feet in length.[72]

An initial analysis of the port facilities indicates that many of Haiti's ports are a good fit for medium sized roll-on roll-off vessels in the twenty-five foot draft range. However, only six of the twenty-seven medium-sized roll-on roll-off vessels in the Maritime Administration's inventory draw twenty-nine or less feet of water. One of these vessels is capable of steaming at twenty-one knots per hour and the other five average fourteen to fifteen knots per hour.[73] A speed of less than twenty knots per hour is rather slow by maritime industry standards. A speed of fourteen to fifteen knots for an ocean faring cargo vessel is extremely slow.

In order to project a significant sized force the Department of Defense's large vessel fleet would require in stream discharges at depths of thirty-five feet or greater. Such a requirement calls for the joint deployment of Army watercraft and stevedores working with the Navy in order to conduct joint logistics over-the-shore. Fortunately for the Army and the Navy many of the units who participated in the United States Transportation Command's (USTRANSCOM) annual joint logistics over-the-shore exercise in

[71] Transportation Engineering Agency, World Ports Database (Transportation Engineering Agency , 2010), https://www.tea.army.mil/asp/processCAClogin.asp?reason=denied_empty&script_name=/res/worldport/default.htm (accessed on August 8, 2010). The Transportation Engineering Agency World Ports Database is a spreadsheet that is posted on the agency's website. The database has informtation on all major world ports that includes draft, berth lengths, storage space, crane availability, and quantity of berths. The database aslo includes information on the ability of ports to accept the large medium speed roll-on roll-off vessel.

[72] Transportation Engineering Agency, World Ports Database. The berths at the port are eight, eleven, fifteen, and twenty-nine feet deep.

[73] Military Sealift Command, Large, Medium-Speed, Roll-on/Roll-off Ships (LMSRs) Factsheet (Military Sealift Command, April, 2010), http://www.msc.navy.mil/factsheet/lmsr.asp (accessed on May 16, 2010).

2009 were deploying to work together once again.[74] The importance of such exercises coordinated by the United States Transportation Command is one of the highlights of the lessons learned from the mission.

The United States Transportation Command dispatched one of its newest units and concepts to assist in opening port operations within Haiti. The new units are the Rapid Port Opening Elements (RPOE). The unit consists of small teams with transportation expertise. Three Rapid Port Opening Elements entered active army service between 2008 and 2009. The United States Transportation Command made the decision to deploy the teams as their Joint Task Force - Port Opening for Seaport of Debarkation (JTF-PO SPOD) operations and as the Army element to the Joint Assessment Team (JAT).

Haiti represents the first use of this concept to open a port during a contingency. A previous deployment of the Rapid Port Opening Element was to Kuwait where the unit took over an existing operation. The Rapid Port Opening Element and the Join Assessment Team opened both the seaport and airport in Haiti making their deployment the only one of its kind.[75] The unit's deployment to Haiti was unique by modern standards. The advanced party from the unit and its equipment sailed to Haiti on the Motor Vessel Huakai. The Huakai is a Hawaiian super-ferry on contract with the Maritime Administration.[76]

The Huakai is very similar to the Department of Defense's catamaran hulled Theater Support Vessel. The main-body of the unit flowed into Haiti several days after the advance party. In the planning of the force-flow, planners put the 2nd Brigade Combat Team of the 82nd Airborne Division ahead of the Rapid Port Opening Element.[77] One of the lessons learned from the mission to Haiti was the importance of flowing the right mix of forces into a theater over time. Achieving the right mix of capabilities at the proper time and place is a constant issue during deployment planning and execution.

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[74] Killblane, 7.

[75] Ibid., 3.

[76] Ibid., 3.

[77] Richard E. Killblane, "Operation Unified Response, Haiti Timeline" (Office of the Chief of Transportation, May, 2010), 2.

In the case of Haiti, it made sense to deploy more logistics upfront rather than combat power. The intent of having the troops from the 82nd Airborne Division on the ground was to distribute aid. Without open airports and seaports, no aid was getting into theater. The decision to deploy the 2nd Brigade Combat Team ahead of the Rapid Port Opening Element put more demands on an immature theater that was in a dire situation. To make matters worse the Brigade Support Battalion from the brigade failed to deploy with all of their equipment. Specifically, they left much of their water production capability at Fort Bragg. Much like Somalia some eighteen years before this mission, the force on the ground was in short supply of fresh water. In addition, the Brigade Support Battalion failed to deploy with their Standard Army Retail Supply System Level-1 (SARSS-1), which allows units to order supply items.[78] The Standard Army Retail Supply System is a Standard Army Management Information System (STAMIS) that units use to order nearly all of their supply items. In Haiti, unlike Iraq and Afghanistan there is no existing Army infrastructure to utilize when someone forgets to deploy with their organic systems and capabilities. Unfortunately, United States Army units operating in Haiti were experiencing many of the tough deployment lessons that the force had previously learned during the Gulf War, Somalia, and the previous mission to Haiti.

The Joint Assessment Team's reporting made it clear that port operations would not occur without joint logistics over-the-shore and inland lighterage systems. The United States Army sent its logistics over-the-shore capability consisting of Army watercraft and a floating causeway system. The United States Navy sent its Improved Navy Lighterage System (INLS).[79] The Navy's system is relatively new and has improved capabilities at high sea states.[80] However, in Haiti this system only worked during

[78] Killblane, 1.

[79] Ibid., 5.

[80] Defense Industry Daily, "Whatever Floats Your Tank: The USN's Improved Navy Lighterage System," *Defense Industry Daily* (May 2009), http://www.defenseindustrydaily.com/whatever-floats-your-tank-the-usns-improved-navy-lighterage-system-02251/ (accessed on August 28, 2010).

high tide.[81] The Navy made the decision not to send its elevated causeway system (ELCAS), which is more labor intensive to establish and more capable in shallower tides.

The Department of Defense contracted a third capability from Crowley Maritime Corporation consisting of two barges that created a makeshift pier. Courtesy of Crowley's innovation, their construction of two 400-foot long barges into an 800-foot long pier was critical to increasing the ports throughput.[82] Crowley Maritime Corporation was also essential in providing additional large and medium sized landing crafts to augment the operation.[83]

The Crowley pier became the critical component of the port operation.[84] The Joint Logistics over-the-shore mission deployed in late January, opened in early February, and ceased operations on March 1st. The Army's Logistics Support Vessel (LSV), a vessel over 250 feet in length that draws twelve feet of water, was the workhorse of the mission early on.[85] Once the Crowley pier became operational, it and the rest of the Army's watercraft saw their utilization rates drop significantly.

The United States Army owns five Logistics Support Vessels, three have homeports at Fort Eustis, Virginia, as part of the 7th Sustainment Brigade, the other two have homeports in Hawaii. The vessel represents a great multifunctional capability during logistics of over-the-shore or during lighterage operations. The only drawback with the Logistics Support Vessel is its slow cruising speed of less than twelve knots per hour.[86] The capabilities of this ship to lighter shipping containers, personnel, and vehicles, combined with its shallow draft, were why this vessel was so highly utilized early on in the

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[81] Killblane, 5.

[82] Rich Miller, "Special Report: U.S. Mariners do the Heavy Lifting at Quake-ravaged Haitian Capital," *Professional Mariner* (May 2010), http://www.professionalmariner.com/ME2/dirmod.asp?sid=&nm=&type=Publishing&mod=Publications%3A%3AArticle&mid=8F3A7027421841978F18BE895F87F791&tier=4&id=35CA088E929E4DCAB82402D0A01BA0F5 (accessed on June 20, 2010).

[83] Killblane, 5.

[84] Ibid., 5.

[85] Transportation Engineering Agency, Surface Deployment and Distribution Command, 402.

[86] Ibid., 402.

earthquake relief mission.[87] These vessels were also essential in ferrying supplies from nearby Guantanamo Bay to Haiti. Fortunately, Guantanamo Bay is relatively close to Haiti making such relief missions feasible. However, a vessel with similar or expanded capabilities concerning speed and cargo space may prove more beneficial in the future, especially when lines of communication are not as close as they were in Haiti. In a logical manner, planners and operators took advantage of Haiti's proximity to Floridian ports and assets in Guantanamo Bay. This logical planning took place during both phases of the operation.

The initial deployment to Haiti suffered from limited operational reach due to the inability to project forces into Haiti. Fortunately, for the United States military this was a humanitarian relief effort not a combat mission. However, the people who suffered from this struggle to project resources into Haiti were the native Haitians who were desperate for any form of relief. The majority of the sustainers who initially deployed to Haiti spent most of their time and effort trying to establish a distribution system. It is always a struggle to get past the first phase of any deployment, which is the reception, staging, onward movement, and integration of forces.

The inability to project power or forces into Haiti restricted the operational commander's tempo or ability to achieve a desirable speed and rhythm of military operations.[88] Initially the United States military was struggling to keep pace with the deteriorating situation on the ground. The inability to quickly project the necessary force combined with the inability to provide services and humanitarian aid quickly limits both the population's and the international community's confidence in the United States. Upon the arrival of the United States, the world's lone superpower, the expectation is that troops arrive ready to provide support. Spending several weeks to get cargos past the shore while also having to establish one's own base camps or life support fails to project the desired image of the United States effort. Obviously, the United States wants to project an image of her forces providing aid to those in need, which is the reason for the mission and such a large endeavor onto foreign shores. Fortunately in Haiti,

[87] Killblane, 5.

[88] Field Manual 3-0, 6-80.

the sustainers on the ground found innovative ways to get the job done. The ability to arrive and provide rapid support has intrinsic ties to the international community's perception of the mission. Goodwill and effort alone fail to accomplish the desired effect. Tempo and simultaneous operations are critical to building momentum and developing international support; this is especially true when trying to garner moral and economic support.

A critical factor in achieving a commander's tempo is the ability to conduct simultaneous operations. As noted earlier, simultaneity is "the ability to conduct operations in depth and to orchestrate them so that their timing multiplies their effectiveness."[89] In the case of the Haiti deployment, a commander would like to conduct the reception, staging, onward movement, and integration while providing an initial push of humanitarian aid. Over a short period, the tempo of the humanitarian aid would increase. The increase in tempo is the result of simultaneity or the synchronization between force projection and the development of on the ground capabilities. This is the result of timing the flow of specific capabilities at the right time to achieve a commander's desired conditions on the ground. The achievement of synergy occurs with the proper combination of numerous elements of operational design. Once this occurs a higher level of results are achievable with fewer resources.

The commander's desired tempo and simultaneity fails to occur when a blockage occurs at the port due to limited infrastructure and the inability of commercial or military vessels to access that limited infrastructure. The result is an early culmination or very limited depth of operations. In the case of Haiti, the result is the inability to project humanitarian relief. The lack of depth is not commensurate with the capabilities and resource wealth of the United States. In combat, the results of such challenges will hit much closer to home. A lack of depth that subsequently results in early culmination may lead to United States troops unnecessarily perishing due to the military's inability to capture and act on lessons learned. The mission to Somalia had many ties or similarities with the mission to Haiti. In both cases, the port

[89] Field Manual 3-0, 3-16.

infrastructure did not allow large vessels access to the harbor, which compounded numerous other problems at the operational level.

The efforts of the deployed force in Haiti were clearly admirable and beneficial. However, the intent of this study is to reflect how to make those efforts more productive and efficient. The effort to build port infrastructure clearly delayed the throughput of dire humanitarian aid.[90] Could a different form of vessel capability have made the mission a greater success? It is important to consider that Haiti is just over 1,000 miles from the Port of Jacksonville. The capability of the Huakai, a commercial equivalent to the high-speed shallow draft Theater Support Vessel, was critical to the successful accomplishment of the mission. The Huakai made several shuttles of equipment from Jacksonville to Haiti alleviating potential failures.[91]

If this scenario were to occur in Africa or Asia, the timeline to get the key units on the ground at the port to initiate vessel unloading and throughput operations may take several months. Although the Huakai was a success on this operation, the need to contract this type of vessel and the short distance of transit are vital lessons to take away from this mission. It appears that the Department of Defense needs more of these vessels and it needs them on its active rolls. Haiti is a great example where a mix of shallow and deep draft vessels would best serve the mission. At the start of the mission during the Initial Response Phase, very shallow draft vessels were the requirement. Later in the mission during the Relief Phase, medium sized vessels would best serve the operation once a pier was in place in deeper water. One cannot understate the importance of joint logistics over-the-shore during this mission. Without the capability, humanitarian aid cargos could only arrive by air in much smaller volume.

Another unique situation that arose from the Haiti mission was the need to contract a commercial pier from Crowley Maritime Corporation. The United States military contracted two 400-foot flat-deck

[90] Killblane, 5.

[91] Ibid., 5.

barges that were converted into a makeshift pier in order to conduct port operations at Port-au-Prince.[92] The ingenuity and innovation of Crowley Maritime Corporation and the units on the ground was invaluable. Fortunately, for all involved the headquarters for Crowley Maritime Corporation is out of Jacksonville, Florida, where the majority of the United States forces embarked for Haiti. Once the makeshift pier was open for use, medium-sized vessels with shallow drafts could access the port. The makeshift pier was operational on February 11, 2010, one month after the earthquake occurring on January 12, 2010.[93]

The situation involving the need to contract the Huakai and the Crowley pier are debatable considering the wealth and capabilities of the United States military. The issue is not the desire or the commitment to conduct such missions but the overarching intellectual effort and the ability to procure the right resources to operate in the underdeveloped world. In the case of Haiti, a high-speed shallow draft vessel that could carry a battalion plus load of equipment may have allowed the rapid projection of forces. A capability of this type would enhance the operational commander's ability to achieve operational reach, tempo, simultaneity, and depth. Although this type of vessel may not alleviate the need for joint logistics over-the-shore, it would enhance the ability to rapidly project power and support the commander's needs. This type of requirement is evidence that the Strategic Mobility Program of the United States military has issues tying their strategic ends and base to the needs of operational commanders.

From a historical perspective, the Haiti earthquake relief mission is an extremely recent event, history is yet to judge the effort of the United States during Operation Unified Response. In the conduct of this study, it was important to include this mission since it involves a modern scenario where projecting resources into a foreign nation was challenging. Furthermore, analyzing the challenges faced by the United States Army forces that had recently undergone a major transformation was worthy of study. The mission represents the first non-Iraqi or Afghan mission that army sustainers have embarked

[92] Journal of Commerce, "Crowley Tests Ship-to-Shore Relief in Haiti," *Journal of Commerce Online* (January 22, 2010), http://www.joc.com/maritime/crowley-tests-ship-shore-relief-haiti (accessed on June 6, 2010).

[93] Killblane, 5.

on since their transformation to modularity in 2006. Studying whether or not the transformation is combating systemic challenges with power projection is something of great interest since Haiti is the first challenge applying stress to that effort.

Recently, many United States Army Transporters have questioned the relevance and importance of conducting an annual joint logistics over-the-shore exercise with the United States Navy. A highlight of Operation Unified Response was how those relationships and lessons learned from the previous year's joint logistics over-the-shore exercise benefited the conduct of Operation Unified Response. The United States Transportation Command hosts the annual exercise. No other exercise forces the United States Army and Navy to work together in such a manner.

Potential African Ports

Nigeria

The choice to use Nigeria as the first of two notional case studies has ties to its emergence from colonialism, resource wealth, political volatility, and issues combating the spread of the human immunodeficiency virus (HIV). Nigeria is currently the fifth largest exporter of oil to the United States.[94] Nigeria is the most populous nation in Africa with a population of over 150 million people. Nigeria is the eighth most populous nation in the world.[95] It is also one of the most developed nations in West Africa making it one the best-case scenarios concerning port infrastructure concerning a military deployment to the region.

At a quick glance, Nigeria has a significant amount of port capability and capacity. They have twenty-seven berths or piers that are over twenty feet in depth. The majority of their port infrastructure supports their oil industry. Ports that are setup to support oil industries are often not conducive to military operations since most of the pier side storage consists of pipes and storage tanks. The main ports of Nigeria are Onne, Lagos, Warri and Port Harcourt. An initial examination of the facilities shows three berths that are capable of docking the large medium-speed roll-on roll-off vessel.[96] The location of those berths is at the port complex in Onne. In February of 2009, an Africa Command case study by the United States Transportation Command initially came to a similar conclusion. However, upon further examination there was a revelation that the harbor's approach to the port could not support the large medium-speed roll-on roll-off vessel.[97]

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[94] United States Energy Information Administration, "Crude Oil and Total Petroleum Imports Top 15 Countries," United States Energy Information Administration (July 29, 2010), http://www.eia.doe.gov/pub/oil_gas/petroleum/data_publications/company_level_imports/current/import.html (accessed on June 20, 2010).

[95] Central Intelligence Agency, The World Factbook – Nigeria, Central Intelligence Agency (June, 2010), https://www.cia.gov/library/publications/the-world-factbook/geos/ni.html (accessed on June 23, 2010).

[96] United States Transportation Command, *USAFRICOM Case Study* (Scott Air Force Base, IL: United States Transportation Command,2009), 27, 29.

[97] Transportation Engineering Agency, World Ports Database.

On paper, the facilities at Onne, Lagos, Warri, and Port Harcourt can fit most of the vessels in the Maritime Administration's medium sized roll-on roll-off fleet. The Port of Onne has six berths, three of which are twenty-nine feet deep. The other three berths are forty-four feet deep. The three berths that are forty-four feet long are all close to 2,000 feet in length.[98] Those berths can fit all of Military Sealift Command's and the Maritime Administration's cargo vessels. However, the channel approach to the port is thirty feet in depth. Because of this, only four of the twenty-seven roll-on roll-off vessels from the medium-sized fleet can access the port. The channel depth also prevents the large medium-speed roll-on roll-off vessel from accessing the port.[99] With proper equipment, enough lead-time, and a permissive environment ports such as the ones in Nigeria can undergo dredging operations to open access to large or deep draft vessels.

The port at Lagos has eleven berths that range from twenty-seven feet to thirty-four feet in depth. The berths range from just under 500 to over 2,000 feet in length.[100] Twenty of the twenty-seven vessels in the medium-sized fleet can berth at Lagos. Two of the twenty vessels in the fleet that can berth at Lagos draw thirty-four feet of water making their ability to berth their challenging and likely to only occur in an extreme emergency.[101]

Port Harcourt has four berths all of which are at twenty-four feet in depth.[102] None of the twenty-seven medium-sized roll-on roll-off vessels in the fleet can berth at the port. The port at Warri presents a similar scenario. The channel depth is twenty-one feet deep. Warri has six berths, four of which could not accommodate any of the fleet's vessels in any scenario. The port has two berths that are thirty-seven feet

[98] Transportation Engineering Agency, World Ports Database.

[99] Military Sealift Command, Roll-on/Roll-off Ships - Ready Reserve Force Fact Sheet (June 2010), http://www.msc.navy.mil/inventory/inventory.asp?var=RollonRolloffship (accessed on June 23, 2010).

[100] Transportation Engineering Agency, World Ports Database.

[101] Military Sealift Command, Roll-on/Roll-off Ships - Ready Reserve Force Fact Sheet.

[102] Transportation Engineering Agency, World Ports Database.

deep. However, none of the fleet can access those berths due to the channel approach being twenty-one feet deep.[103]

The analysis of Nigeria's ports shows that none of the nineteen large medium-speed roll-on roll-off vessels in the Department of Defense's cargo fleet can access or dock at Nigerian ports. Furthermore, only a portion of the medium-sized fleet can access two of Nigeria's port facilities. Nigeria is a prime example of the sealift challenges the Department of Defense may face in Africa. The nation is home to many of the deepest and largest ports in West Africa, yet, the majority of the Department of Defense's fleet cannot access those ports and harbors due to depth constraints.

[103] Military Sealift Command, Roll-on/Roll-off Ships - Ready Reserve Force Fact Sheet.

Kenya

The choice to use Kenya as a second notional case study is due to its geographical location in East Africa. Kenya borders Somalia, Ethiopia, and Tanzania. Kenya does not possess the resource wealth of a nation such as Nigeria. However, its proximity to Somalia and its volatility make it worthy of further examination. In the future, the nation may serve as a staging base for regional or international efforts to combat lawlessness in Somalia. The prevalence of the human immunodeficiency virus provides the potential for Kenya to become a future location for a humanitarian relief effort.

Kenya has one active world-class harbor which is the port of Mombasa in the nation's southern portion of their coastline. The port facility at Mombasa has eighteen berths that range in depths from thirty to thirty-six feet deep. The channel approach is forty-two feet in depth. The port has one berthing section (berths 16-18) that is thirty-six feet deep.[104] The berth is not capable of accommodating the large medium-speed roll-on roll-off vessel at its maximum draft of thirty-six feet two inches. However, if the vessel was carrying a light load it may be able to access this port. No other part of the port or nation can accommodate the large medium-speed roll-on roll-off vessel. In 2009, the United States Transportation Command conducted an Africa Command Case Study, which determined that Mombasa could not accommodate the large medium-speed roll-on roll-off vessel due its draft depth.[105] However, in an emergency one may be willing to accept a minimal margin of error by constraining stowage factors on the vessel.

The remaining fifteen berths can only fit six of the twenty-seven vessels in the Military Sealift Command's medium-sized roll-on roll-off fleet. The port has decent depth with eighteen berths at or above thirty feet. However, only four of the vessels in the medium-sized fleet draw less than thirty feet of water.[106] Kenya is an excellent example of a nation where medium-sized shallow draft vessels are a requirement. Especially when there are concerns, as to whether the large medium-speed roll-on roll-off

[104] Transportation Engineering Agency, World Ports Database.

[105] United States Transportation Command, USAFRICOM Case Study, 26, 28.

[106] Military Sealift Command, Roll-on/Roll-off Ships - Ready Reserve Force Fact Sheet.

vessel can fit. The Somalia case study revealed that during the early stages of Operation Restore Hope, several ships that were over thirty feet deep traveled to Mombasa, Kenya, hoping to discharge their cargo. Those ships never made it into the harbor due to their hazardous cargo. The hazardous cargo was the initial ammunition resupply.[107]

Kenya's possession of eighteen berths of over thirty feet in draft is impressive and the ability to confidently dock only four vessels out of the twenty-seven medium sized roll-on roll-off fleet and none of the larger fleet is concerning. The Somalia case study indicates that a reliance on joint logistics over-the-shore in this region as being of high risk. The prevalence of high sea states in the region limits the ability to conduct such operations.[108] Weather delays during the port opening process proved to have disastrous potential during Operation Restore Hope when the ability to conduct joint logistics over-the-shore underwent numerous sea state delays. The greatest potential challenge to operating in Africa is that the best deepwater ports are in the northern and southern portions of the continent. Further complicating efforts to operate within Africa is the lack of a highway or rail network that connects those deepwater ports to the rest of the continent. The distance between Tunis in the north and Cape Town in the south is over 4,800 miles. This is the equivalent of the distance between Chicago and Hawaii.[109]

[107] Kassing, 32.

[108] Ibid., 32.

[109] United States Transportation Command, 4.

Conclusion

The historical case studies of Somalia and Haiti indicate that the United States' strategic mobility program relies too heavily on its large cargo vessel fleet, specifically the large-medium speed roll-on roll-off vessel. The notional case studies of Nigeria and Kenya portray a similar theme. In fact, when the United States Army's Surface Deployment Distribution Command studied African ports, they found only four out of twenty-nine ports that fit all of their criteria for large vessel discharges. The criteria were depth, access to roll-on roll-off ramps, and container cranes. Ten of the ports were deep enough to allow the discharge of the large medium-speed roll-on roll-off vessel.[110] All of those ports were in either South Africa or Northern African nations with the exception of Senegal and Ivory Coast, which are West African nations. The twenty-nine ports came from an aggregate of twenty-one countries. The study simply looked at berth length and draft; there are still concerns whether a large medium-speed roll-on roll-off could sail into the approaches to many of those ports.[111]

The United States does not have the right mix of ships to quickly project power and then subsequently receive, move, and integrate that equipment back into their respective units. The missions in Somalia and Haiti tie directly to the Mobility Requirements Study Bottom-Up Review Update's identification of the need for medium sized roll-on roll-off vessels that can access the majority of the world's ports.[112] Despite their experiences in Somalia and Haiti, the United States based the majority of its surface fleet projection development in the form of the large medium-speed roll-on roll-off vessel. The need for the medium sized roll-on roll-off fleet has direct links to today's changing nature of conflict and the re-stationing of forces to the continental United States. The changing nature of conflict and the re-stationing of forces have increased the need for strategic lift, especially sealift. The need to project power

[110] United States Transportation Command, USAFRICOM Case Study, 6.

[111] Ibid., 26.

[112] Hickins, 36. COL Kenneth Hickins' article details the shortcomings and blessing of the LMSR. Specifically, he highlights how three LMSR's contained pre-positioned afloat cargo could not land in Somalia due to port limitations. Furthermore, the 7th Transportation Group was scheduled to conduct a JLOTS due to the restrictions. However, stevedores from the brigade did not arrive in time and the ships steamed back to Diego Garcia. In the end, those ships were never unloaded or utilized in Somalia.

quickly is increasing while the capability remains stagnant and low in the list of priorities. The need to deploy smaller sized forces of brigade, division, or single corps size to engage in limited warfare is likely to grow.[113] The ability to project that type of force in accordance with the Quadrennial Defense Review, the National Military Strategy, and after action reviews of previous conflicts has not advanced with regard to sealift despite routine identification as a requirement. In this regard, sealift fails to support the emerging needs of future operational commanders. Obviously, commanders desire flexibility when deploying a force, not constraints that limit their potential options.

In the African scenarios this monograph examined the transit time for most of the Army's ocean going vessels is fourteen to twenty days.[114] The fourteen to twenty day estimate does not include the intangibles of how long that equipment would take to load, where that equipment is currently located, and if it is all combat ready. There is only one unit on active duty that conducts such missions for the Army. What used to be a composite transportation group, the Army's 7th Transportation Group, is now a multifunctional sustainment brigade. Since 2003, the focus of that unit has predominately been supporting land-based operations in the Iraqi theater of operations. The brigade has done admirable work while they were supporting Iraqi and now Afghan operations, however the Department of Defense's competence at conducting strategic mobility may be in decline.

The point is not to argue the decisions made in the conversion, since both types of units are necessary, however, as the United States transitions to advise and assist roles in their current missions it may behoove the United States to reexamine that decision. The sustainment brigade that was created focuses its primary training effort on deploying to provide inland support, not port operations. Those missions are multifunctional logistics missions. When the decision was made to convert the 7th Transportation Group the Army assumed risk on its ability to conduct joint logistics over-the-shore and

[113] United States Army, *Field Manual 5-0, The Operations Process* (Washington D.C.: Government Printing Office, March, 2010), 3-19. Army FM 5-0 defines the era of persistent conflict as "protracted conflict among state, non-state, and individual actors that are increasingly willing to use violence to achieve their political and ideological ends."

[114] United States Transportation Command, *Joint Logistics Over-the-Shore Planners Handbook,* 43.

port operations. The Army made this decision knowing they have Executive Agency responsibility to serve as the single manager for land transportation and common user ocean terminals.[115] The deployment to provide relief after Haiti's earthquake on January 12, 2010, is the first time Army watercraft deployed in a significant manner since the units transformation to a modular sustainment brigade. The mission to Haiti provided one of the first opportunities to examine the performance of the brigade and many of the new "plugs" or small joint task force elements that augment port openings.

The after action reports from Haiti indicated the need for a brigade level unit that managed Army watercraft in a fulltime manner. In addition, the after action report notes that certain key personalities with experience in watercraft operations made the mission happen.[116] The after action reporting on the Haiti deployment does not account for some of the "what if's" that a similar deployment may present in a few years from now as the modular sustainment brigades mature. What if a sustainment brigade other than the 7th Sustainment Brigade deployed on this endeavor? Would they have the in-house experience to accomplish the mission? Many of the intangibles that after action reporting and daily operations fail to account for or identify may become major issues on future missions when personnel with multifunctional logistics backgrounds attempt to solve problems requiring a high degree of technical knowledge in port or watercraft operations. Having the right type of unit with the right type of training and capability to operate the port enables a successful reception, staging, onward movement, and integration. This clearly enables a commander to integrate the elements of operational art into their planning. Unexpected issues conducting reception, staging, onward movement, and integration can desynchronize entire plans. The horror of such a scenario is that the operational commander is forced to operate with the force he has on-hand at a given point of time and space. It is too late once the deployment process starts to make significant changes to the task organization or training readiness once at the ports of embarkation.

[115] United States Army, *Field Manual 55-1, Transportation Operations*, (Washington D.C.: Government Printing Office, October, 1995), 2-53.

[116] Killblane, 5.

The analysis of the Somali and Haitian operations concludes that the large medium-speed roll-on roll-off vessel was not the right type of vessel to deploy forces to those locations. However, the United States' fleet of large medium-speed roll-on roll-off vessels provided the ideal type of cargo vessels for Operation Iraqi Freedom. These results provide a great narrative or argument for those who object to the costly purchase of a modern shallow draft medium-sized vessel fleet. Another great argument is that the C-17 fleet has proven itself invaluable in projecting power to the Afghan theater of operations.[117] Its ability to carry large loads, land on unimproved and short runways is simply unparalleled. The large medium-speed roll-on roll-off vessel and the C-17 are examples of what strategic mobility reviews and efforts have gotten right. However, neglect in the medium sized roll-on roll-off fleet can continue to serve as a source of frustration. One large medium-speed roll-on roll-off vessel represents 239 times the square footage of one C-17.[118] Clearly, sealift represents a more economically feasible means of transport. The results of this study clearly identify the need for medium high-speed sealift since the majority of world ports are not large medium-speed roll-on roll-off vessel capable.

The argument that civilian economy can fill the sealift void much like the United States Air Force's use of the Civil Reserve Air Fleet (CRAF) contains numerous flaws. To start with, the Maritime Administration and Military Sealift Command possess the nation's largest fleet of United States owned and operated roll-on roll-off vessels. There are currently fourteen commercial roll-on roll-off ships operating within the United States that meet the criteria of the Jones Act. Jones Act vessels are those vessels that operate under a United States flag, have ownership by United States citizens, and were constructed in the United States or salvaged and rebuilt in the United States.[119] The Jones Act or Merchant Shipping Act of 1920 specifies the criteria to conduct trade or to carry goods between United

[117] Christopher Bolkcom, "Military Airlift: C-17 Aircraft Program Background" (Washington D.C.: Congressional Research Service, 2008), 5.

[118] The C-17's cargo bay is 88 ft long by 18 ft wide giving it 1584 square feet of storage space. This does not factor in cube (including height) or the max weight the plane can lift. It can easily max out on weight or cube prior to the square footage estimate being used in the comparison. 380,000/1584=239.89.

[119] United States Transportation Department - Maritime Administration, US.-flag Oceangoing Privately-Owned Fleet of 10,000 DWT, United States Transportation Department - Maritime Administration (October, 2009), www.marad.dot.gov/documents/us-flag_fleet_10000_dwt_and_above.xls (accessed on September, 20, 2010).

States ports. Six of those fourteen vessels are under active contract with the Military Sealift Command. Fifty-three more commercial roll-on roll-off vessels operate under the United States flag.[120] The majority of those vessels are under some form of contract with the Military Sealift Command. This is through the Voluntary Intermodal Sealift Agreement (VISA), the sealift equivalent of the Civil Reserve Air Fleet.

In addition to the Jones Act, the Military Cargo Preference Act of 1904 states that 100% of military cargo is to move by United States flagged vessels.[121] The shipping laws of the United States are evidence of the desire for a self-sustained maritime capability. However, participation in the global economy encourages carriers to use flags of convenience, which are leading to less United States ownership of shipping companies and vessels. It is much less expensive for most companies to build, register, and crew their vessels outside of the United States. This phenomenon is occurring at the same time when the bulk of the United States land combat power is re-stationing to the continental United States. Clearly, this formula cannot achieve success. Furthermore, it does not assist future operational commanders in linking the strategic base of the United States to their desired operational reach, tempo, simultaneity, depth, and synchronization. As a system, the United States' Strategic Mobility Program is failing to link the strategic and operational levels of war.

Recent history has proven that the United States military has historically focused on fighting large-scale wars while avoiding complex or ill-structured smaller scale scenarios such as Vietnam and Afghanistan. The historic inability to balance the military's capabilities across the entire spectrum of potential conflict is a continuous flaw in United States war planning. The same debate applies to strategic sealift; the majority of the United States' investment focuses on extremely large ships that can only conduct missions to developed ports. However, the Department of Defense's strategic mobility program requires the balance that shallow draft medium sized vessels can provide. This mix of capabilities

[120] United States Transportation Department - Maritime Administration.

[121] United States Transportation Department - Maritime Administration, Cargo Preference, United States Transportation Department - Maritime Administration (2009), http://www.marad.dot.gov/ships_shipping_landing_page/cargo_preference/Cargo_Preference_Landing_Page.htm (accessed on September, 20, 2010).

provides the flexibility that operational commanders desire when trying to incorporate the elements of operational art and design into their campaign planning. The United States should maintain an emphasis on joint logistics over-the-shore operations since it is a proven national level capability and asset that provides flexibility at the operational level.

The Haiti case study shows the critical role the United States Transportation Command plays in ensuring the conduct of joint annual training and readiness exercises. The importance of the command hosting the annual joint logistics over-the-shore exercise was a critical lesson learned from Operation Unified Response. However, the Somalia case study proves that joint logistics over-the-shore has limitations, especially in areas that are prone to high sea states. The argument that the existing capabilities of the large vessel fleet combined with joint logistics over-the-shore can solve all berthing issues only works in certain scenarios. Those scenarios require fair weather and developed infrastructure. An improved medium sized fleet would enhance joint logistics over-the-shore efforts. Reducing the depth of lighterage points and the length of causeways has the potential to mitigate weather challenges during joint logistics over-the-shore missions. Medium-sized shallow draft vessels are likely to lessen the reliance on joint logistics over-the-shore or shorten its duration of employment during conflict. Another benefit is that many vessels would be relieved from lightering duties, which would enhance the potential for expanded throughput operations at sea, or on inland waterways.

This type of scenario would enhance an operational commander's range of options once in a theater of operation. Such options enhance the ability to incorporate the elements of operational art. By meeting or exceeding the scientific or mathematic requirements a scenario requires the ability to conduct the art portion of the deployment process expands significantly. This is where successful employment of the elements of operational art and design best occurs at the operational level. What is often missing is the initial opportunity to employ those elements.

Operation Unified Response, the Haitian earthquake relief mission, displays some potential issues with United States Army's transformation to a modular force. Modularity looks great on paper, deployment patch charts, and force generation models. However, in the case of Army watercraft, Haiti

shows a need for a standing functional brigade headquarters that manages the majority of the Army's navy.[122] The mission to Haiti can serve as a great opportunity to reflect such shortcomings and how to overcome them. Failure to do so provides unnecessary chance or risk during future missions.

Operation Iraqi and Enduring Freedom deployments are providing a high level of tactical competence to the operational force. However, those deployments are not providing competence at the task of tying the strategic base to an operational commander's needs by conducting joint logistics over-the-shore. Furthermore, those deployments no longer provide significant reception, staging, onward movement, and integration challenges since the theaters are relatively mature. Lastly, those deployments no longer provide the challenges of deploying to an immature theater of operations. Afghanistan certainly provides numerous challenges based on it being a land-locked nation. However, the United States military has operated in that theater for nearly a decade now.

There has to be a balance in the spectrum of capabilities that units train to provide. Haiti is evidence that competence in Army watercraft operations above the battalion level is a shortcoming that can only increase in severity over time. The argument that a generalist can learn the mission once assigned to a unit briefs well when considering cost savings. However, Haiti shows that catastrophes are not planned events. They occur in less than a moment's notice without regard to a unit's operational tempo or level of training. Haiti was the sounding of a gentle alarm; hopefully the lessons learned while supporting Operation Unified Response initiates the transformation in sealift that United States military currently requires.

[122] Killblane, 7.

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